Reviewer Recommendation and Comments for Manuscript Number JTV-D-15-00073

Numerical evaluation of scar resulted after breast reconstruction by abdominal advancement flap

Original Submission
Cormac Flynn, PhD (Reviewer 2)

Back | Edit Review | Print | Submit Review To Journal Office

Recommendation: Major Revision

Manuscript Question(s):	**Scale**	**Rating**
Please rate on a scale of 1-3 whether the Highlights are a meaningful and accurate representation of the article. 1 = Meaningful; 2 = Not Meaningful; 3 = Not Provided. For more information, see www.elsevier.com/highlights	[1-3]	3
Please rate on a scale of 1-3 whether the Graphical Abstract is a meaningful and an accurate representation of the article. 1 = Meaningful; 2 = Not Meaningful; 3 = Not Provided. For more information, see www.elsevier.com/graphicalabstracts	[1-3]	3

Reviewer Blind Comments to Author:

Summary
This manuscript presents a numerical study on the difference between using an anatomical implant and using a round implant in breast reconstruction surgery. A simple linear elastic model was used to model the implants. An Ogden constitutive model was used to represent the skin. Results indicate that the different implants results in a different scar loading. Anatomical implants result in a more favourable scar loading. The study is a challenging one and the results would be of interest to anyone in the field. I do have comments and concerns about the method and results. I think some aspects need to be revised such as the choice of model for the implant. Much of the method also needs to be clarified. These and other comments are detailed below.

Specific comments
The manuscript would benefit from a proof-read by a native English speaker

Page 1, Line 1: Can the authors elaborate briefly on how the "treatment of breast cancer has developed a lot during the last decade"?

Page 2, Line 3: What is a clinically useful amount of time?

Page 2, Line 9: The aim of the study is to evaluate the stress concentration around sutured wounds and forces in stitches. Why are you looking at this? What is the effect of these parameters on the recovery and health of the patient?

Page 3, Line 1: By "pushed down" do the authors mean compressed?

Page 3, Line 1: Why was loading speed of 30 mm/min used?

Page 3, Line 7: Are four-node solid elements tetrahedral elements? It would be clearer if this was stated

Page 3, Line 7: An image of the finite element model would help in clarifying the method. I find it difficult to understand what is meant by fully-constraining the lower surface of the implant

Page 3, Line 8: Was an automatic optimisation scheme used to update the material parameters? If so, what was it

Page 3, Line 16: Why was a linear elastic model chosen? I do not think this is an appropriate model to use. The model is undergoing large deformations. A hyperelastic model such as Mooney-Rivlin or Ogden would be more appropriate. A Poisson's ratio of 0.1 indicates a very compressible material. Are implants that compressible?

Page 3, Equation 1: The authors need to check the formulation of the Ogden model. I think the index on J is incorrect. Also, a bulk modulus K is also mentioned but does not appear in the equation

Page 4, Line 6: Why were the elements chosen according to the distance between stitches? This will have an effect on the results. The mesh should be chosen according to the convergence of results

Page 4, Line 8: I do not understand what the boundary conditions are. Can the authors provide further clarification? Can the authors also provide a diagram to support the description?

Page 4, Line 10: How realistic is the assumption of no friction? What is the effect of this assumption on the results?

Page 4, Line 11: What are the implications of neglecting the pre-stress in human skin?

Page 4, Line 14: Can the authors briefly describe what trust elements are? Many readers will not be familiar with them

Page 5, Line 4: Geometrical accuracy was determined by comparing the Euclid distance between corresponding nodes on deformed and non-deformed meshes? What is the non-deformed mesh? The mesh prior to insertion of the implant? can the authors clarify

Page 5, Line 8: The authors state that agreement is very high around the nipple area. How does the deformation here compare to the deformation around the scar area? Presumably it is much smaller so a higher agreement is more likely

Page 7, Line 13: What direction are the Langer lines in the region of the breast concerned? Does your modelled incision follow Langer lines in the area?

Table 2: Where was the location of the maximal error?

Reviewer Confidential Comments to Editor:
EVALUATION: (Please rate according to the following scheme)

Superior = 1 Acceptable = 2 Marginal = 3 Poor = 4

_ Originality 2
_ Methodologically Sound 3
_ Follows Appropriate Ethical Guidelines 2
_ Has results which are clearly presented and support the conclusions 3
_ Overall Scientific Quality 3
_ Presentation, Organization, Clarity 3
_ Correctly References Previous Relevant Work 2
_ Importance/Interest 2

OVERALL ASSESSMENT: (Please check statement that most clearly applies)

___ Extremely well done; new data; major importance; high priority
___ Good work; extends or confirms what is known; medium priority
X Some important information; needs major change; low priority
___ Not of sufficient interest for publication

Confidential Comments To Editor:
Nothing in addition to the above.

Please note that your recommendation and reviewer report are expected to cover the Highlights and Graphical Abstract if submitted with the manuscript.

Back Edit Review Print Submit Review To Journal Office